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| 10/509,996 | 10/05/2004 | Tobias Tynderfeldt | 4147-90 | 4653 |
| 23117 | 7590 | 11/30/2006 | EXAMINER | |
| NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203 | | | NGUYEN, LEON VIET Q | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2635 | |
| DATE MAILED: 11/30/2006 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/509,996

Applicant(s)

TYNDERFELDT, TOBIAS

Examiner

Leon-Viet Q. Nguyen

Art Unit

2635

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/5/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 10/05/2004 was filed after the mailing date of the 10/05/2004. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 3, 8, 13-14 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 3, 8, 13 and 18, the phrase "for instance" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 14 recites the limitation "the first number of sub-set". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1, 7, 9-11, 17, and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Lindskog et al (US20060115031).

Re claim 1, Lindskog discloses a method for avoiding inter-layer inter-symbol interference, characterized by the steps of

using a diagonally layered multi-antenna transmission utilizing a number of layers (¶0064, it is well known in the art that in diagonally layered space-time architecture symbols are fed to antennas in turn);

dividing symbols of each layer into a first number of parts of layers, the number being a multiple of the number of layers (¶0021, fig. 7);

associating the parts of layers to a second number of transmit antennas such that all antennas transmit an equal number of parts of each layer (¶0021, each symbol stream contains half the symbols);

inserting known symbols between the parts to each transmit antenna (¶0060), a number of known symbols being at least as many as a number of symbol spaced channel taps

minus one (§0061, two training symbols per channel block, §0063) seen by a receiver to avoid inter-layer inter-symbol interference.

Re claim 7, Lindskog discloses a method characterized by the further step of adaptively changing a transmitter algorithm used between layering over one or several antennas depending on a modulation scheme (§0023), and/or a code rate of an outer channel code.

Re claim 9, Lindskog discloses a method characterized by the further steps of dividing a transmit antenna array into sub-sets of transmit antennas, each sub-set containing an arbitrary number of transmit antennas (§0009, the system comprising for a first and second spaced antenna within one group); dividing the layers into sub-sets of layers, each sub-set of layers corresponding to a sub-set of transmit antennas (§0023); diagonally layering the layers within a sub-set, while not permitting layering across different transmit antenna sub-sets (§0064, §0070, transmit delay diversity).

Re claim 10, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 9. Furthermore, Lindskog discloses setting up a transmit antenna arrangement constituting an even number of individual antennas, the transmit antenna array being divided into sub-sets of two individual antennas (§0009, §0070, dividing the group of transmit antennas into 2 groups).

Re claim 11, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 1. It would be inherent to have a system to perform the method as claimed.

Re claim 17, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 7.

Re claim 19, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 9.

Re claim 20, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 10.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-6 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindskog et al (US20060115031) and further in view of Li (US6654429).

Re claim 2, Lindskog fails to teach a method characterized by the further step of inserting the number of known symbols at the border between the different layers with at least as many as an expected channel memory for a channel observed by a receiver. However Li teaches selectively inserting pilot symbols at predetermined tones in members of a sequence of successive OFDM blocks (col. 6 lines 16-26, fig. 4a).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use pilot symbols as taught by Li into the method of avoiding inter-symbol interference of Lindskog to suppress channel noise and improve channel estimation (col. 6 lines 46-50).

Re claim 3, Lindskog discloses a method characterized by the further step of inserting the known symbols at the borders between the different layers (§0061) and also using inserted known symbols also for purposes such as for instance channel estimation or similar purposes (§0061, claim 14).

Re claim 4, Lindskog discloses a method characterized by the further step of letting the first number of layers having an equal size (fig. 7).

Re claim 5, Lindskog discloses a method characterized by the further step of making the known symbols to constitute a training sequence (§0061).

Re claim 6, Lindskog discloses a method characterized by the further steps of, in a system having a first and a second transmit antenna (fig. 7), and a burst structure containing a training sequence in the middle of a burst and with data fields to either side of the training sequence (fig. 7, the r_1 and r_2 blocks being data fields and the two blocks combined to create one frame or burst), transmitting a layer one in a left data field and a layer two in a right data field from the first antenna (fig. 7, $d_1(t)$ is layer one and $d_2^*(N-t)$ is layer two), while transmitting from the second antenna the layer two in the left data field and the layer one in the right data field (fig. 7, $d_2(t)$ is layer one and $d_1^*(N-t)$ is layer two) and from each antenna separating the two layers by the known training sequence (fig. 7) to thereby avoid inter-layer inter-symbol interference.

Re claim 12, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 2.

Re claim 13, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 3.

Re claim 15, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 5.

Re claim 16, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 6.

5. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindskog et al (US20060115031) and further in view of Suzuki et al (US20010048662).

Re claim 8, Lindskog fails to teach a method characterized by the further step of using a fixed layering method for header information indicating for instance coding and layering of data. However Suzuki teaches the use of layered headers which contain control code data and which indicate whether layered data is at the top or in the middle of layered frame data (§0066).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the layered headers of Suzuki into the method of avoiding inter-symbol interference of Lindskog to initiate or terminate the process of discarding packet data when congestion occurs (§0012).

Re claim 18, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon-Viet Q. Nguyen whose telephone number is 571-

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270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vu Le can be reached on 571-272-7332. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Nguyen/


VU LE
SUPERVISORY PATENT EXAMINER